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ABSTRACT

This is one in a series of publications designed for parents and teachers to help children acquire developmentally appropriate basic educational skills at home and in school. Topics included are: (1) "What is science?"; (2) "Why is science important?"; (3) "How children develop science skills?"; (4) "You can help your children learn science" listing many suggestions for indoor, outdoor, or everyday trips; and (5) "Points to keep in mind." (YP)

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Getting Involved:
Your Child and Science

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Children are natural learners — each one unique, developing in his or her own way. Children learn at their own rate, and in many ways — by doing, playing, trying out, and initiating. They learn best when an activity is relaxed and a pleasant experience for them, their parents, and others in the family. The Getting Involved series is designed for parents, teachers, and other professionals in Head Start and the elementary schools. It provides ideas for helping children acquire developmentally appropriate basic educational skills at home and in school.

Head Start Bureau

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Basic Educational Skills Project

Getting Involved:

Your Child and Science

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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A Head Start Initiative in Collaboration with Elementary Schools

Four-year-old Marti was standing on a stool near the kitchen sink, where her mother was busy washing dishes. Marti dipped her hands into the dishpan of soapy water. She moved her hands around, as she had seen her mother do, and was surprised to see the piles of bubbles grow larger. Most of the bubbles were very small, but a few on top were big. Marti leaned over and blew into the dishpan. A few clumps of bubbles flew to the side and she heard little popping noises. She held her breath and listened carefully. The noises didn't quite stop, but they seemed to be quieter. She blew again. The popping sound got louder and faster. When she tried it again, the same thing happened.

"Mama, did you know bubbles are noisy?" she asked.

"Never thought about it before," answered Marti's mother, smiling. "Here, I'll give you a bowl of dishwater over on the table, so I can get the dishes done.

Marti's mother was teaching science. She was giving her child a chance to find out new things for herself. She was encouraging Marti to experiment and observe, to be careful, and to share what she saw, heard, and felt. Marti was being a typical four-year-old scientist—curious, active, and trying to find something out.

Children can learn a lot of science from almost everything around them, and parents can help them learn. While this often requires time and patience from parents, it will help your children in school and everyday life. That is what this booklet is all about.

Children learn about science from almost everything around them. 3

What is science?—

Science is an active search—

Many adults are afraid of science. They believe that science is some mysterious activity conducted by people in white coats in laboratories. It isn't. In fact, the scientific method is something that we are all involved in. It is a series of actions that we perform every day. Science is:

- looking for answers to questions about why events happen or how things work
- sensing, exploring, and experimenting
- repeating these actions to make sure that we have the right answer

Science is a way of thinking. It is asking questions, finding answers, and going on to ask more questions.

Science is information—

Science is information about the world and about ourselves. People in all cultures have used science to learn important facts, such as what foods to eat, how to protect themselves from the weather, and how to treat illness. They have passed such information on to the next generation.

Science is creative thinking—

A scientist explores the world in new ways. So does your child. For children, exploration and discovery are fun. The excitement children and scientists feel when they make a discovery is important, because this good feeling helps keep people working at science. When you share your child's excitement in a new discovery, you are helping your child learn science, too.

Science is everywhere, every day. Everything people invent and build is based on science—from a simple can opener to a complicated CB radio. Studying nature is also science. Much of what you have learned about weather, water, air, soil, rocks, food, plants, animals, and human beings is scientific information. These useful and practical facts help you make decisions and solve problems every day. For example, you look outside when trying to decide what clothes to put on, and you listen to the weather forecast to help plan your day.

Learning how things work is part of science.

Why is science important?—

Children who have many scientific experiences at home and at school are more likely to develop positive attitudes toward all types of learning. For example, these children would be more interested in knowing why it is important to wash our hands or look to see if fruit is ripe. Science can teach them:

- **patience and persistence**—how to approach a task over and over again
- **inquiry**—how to ask questions and look for ways to solve problems
- **respect for honest evidence**—how to distinguish truth from make-believe, and how to use evidence to prove something
- **open-mindedness**—how to respond when one of their scientific experiments doesn't work out as expected
- **resourcefulness**—how and where to find information and other help
- **self-reliance**—how to begin to investigate problems on their own
- **respect for another person's opinion**—when to go to someone else for information

These are all good attitudes to bring to school. Science skills and attitudes are basic to education and to life. As children practice these skills and attitudes, they are developing a scientific point of view about everyday life that they will find useful again and again, even after they have grown up.

Science experiences at home encourage children to want to learn more.

How children develop science skills—

Babies notice objects and events around them from the time they are born. As they grow, they use their hands, their feet, and their whole bodies to reach out and learn about things around them.

For the first few years of their lives, children like to repeat activities—handling objects, feeling them, putting them in their mouths to taste them—over and over again. Through these experiences, they are building the basis for later science skills.

Children become even more scientific as they grow older. Once they start to talk, they can get information by asking questions. They can also use words to put thoughts together, to organize their thinking. They learn to sort objects, to group ideas, and to look for explanations for causes and effects. They learn to turn to adults and other sources for help. The more curious they get, the more they experiment. The more they experiment, the more they learn about science.

A wide range of experiences can help children learn science.

You can help your children learn science—

Science learning begins at home. Children are curious about their surroundings. By encouraging that curiosity, parents can help their children learn. At the same time, scientific learning requires careful observation, which can result in greater safety in the home

Indoors—

You can use many of your everyday activities to teach science to your children. When they wake up, encourage them to observe the weather or to watch the TV weather report in order to decide what clothing to wear. Cooking with your children gives them a chance to see how different foods go together to create something new. Children are often interested in changes that happen to foods as they cook. They are curious about how steam rises, how water condenses on the lid of the pan, and how pudding thickens. Your kitchen can become a science laboratory.

Show your children the tools and equipment you are using as you clean and repair things around the house. Let them handle real tools, since children like to do what adults do. Explore how your house or apartment works. Trace where the water goes from the sink by following the water pipes. Discuss where electricity comes from. The possibilities are endless.

Outdoors—

Explore the outdoors with your children. Compare different street surfaces, such as concrete and gravel. Point out different kinds of vehicles and how they are powered. Watch for rain clouds in the sky and rainbows in the oil slick on puddles. Study rocks, sticks, or litter, and discuss where they might have come from. Encourage your children to observe where water forms pools and where plants grow. Look for worms, birds, and other animals. Study the weather, the sun, moon, and stars. Fly a kite or paper airplane. Float a toy boat or a board in a puddle. Make shadows, and notice where other shadows come from. Look at buildings being built or torn down, and study how they are put together.

Whenever you are outdoors, you can encourage your children's curiosity.

Everyday trips—

Taking your children on errands with you can be a science experience, too. Point out different fruits and vegetables in the supermarket. What kinds of science experiences could you have together at the gas station? Drugstore? Laundromat? Think about what you could point out as you ride through traffic, wait for your turn at the bank, walk by a factory, or watch a freight train pass. A walk in the rain or snow or through the fallen leaves can be a learning experience, too.

You can also plan special family trips to new places where science learning can take place. You don't have to spend a lot of money or go great distances. If you live in the city you can visit airports, bus stations, zoos, museums, playgrounds, parks, or waterfronts. If you live in the country you can visit farms, forests, swamps or riverbanks. Try to explain things to your children as they encounter new experiences.

Exploring many places near your home can be a learning experience.

No matter where you are—

You are probably the first science teacher your children will have. You teach them many things in many ways. Here are some of the ways you can help your children make the most of any science experience anywhere:

- **Pay attention when they are curious.** Watch when your child snaps a rubber band, listening to the sound. If you smile and nod, the child will know you approve of the experiment.
- **Encourage your children to pay attention.** For example, you might say, "Hear the jet plane up there? Can you see it?" Help them notice things that are happening around them. "How does the kitten find its mother when its eyes are still closed?"
- **Share your concerns and your observations.** You can say, "See how I am careful to get all the food off my teeth when I brush them?" If it is important enough for you to notice, children will want to see, too. Take time to share what is important. Your children are more likely to pay attention to things you are concerned about.

Encourage your children to pay attention.

- **Suggest things for your children to do.** Ask questions such as, "What would happen if you blew at that dandelion?" Encourage activities in which children can find out results for themselves.

- **Help your children notice causes and effects.** "I bumped the table and it made the water in my glass move." Or suggest to children that they pour water onto the sidewalk, then blow on it and watch it dry. Show them what is happening. Explain it. "The ice melts because the lemonade is warmer than the ice."

- **Urge your children to talk about their experiences.** Ask them what they are doing in science work at school. Listen when they explain things that have happened. Add words to help them describe what they see.

- **Encourage your children to try new things.** Children cannot learn about floating and sinking if you say, "Stop playing in the water." They cannot learn to judge the weight or texture of a rock if you tell them not to pick it up. Children who are used to being told "no" don't experiment or investigate, even when the activity is safe. Children may turn to you to see if it is all right to try something. Encourage them—they sometimes need your permission to explore. But remind them that they must be careful to look closely at things and not to get hurt.

- **Try to provide materials.** Children can find something to do with almost any object. They will try balancing and building, rolling and pulling, bouncing and tipping—anything—just to see what happens. Older children are likely to be interested in projects. If a certain school activity interests them, encourage them to set up something similar at home and explore with them how it is done.

- **Look for books and pictures for your children.** Books about scientific experiences that children have had are especially helpful. "Here is a book about robins. It shows how they make a nest." Your public library and bookmobile have books on many scientific subjects for children.

- **Try to provide some space for your child to play or work.** Children can concentrate better and enjoy their activities more when they have a small corner of their own. It might take effort in most homes to find such extra space.

Your children want to be like you, too. When you are curious and open-minded, you help your children become curious and open-minded. Share with them your know-how and the activities you enjoy and do best. Express your ideas and interest in science topics.

Materials from around the house can be used for experiments.

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You don't have to know all the answers—

Well-known scientists were asked if they thought they could answer any question a four-year-old might ask. Being parents themselves, they answered, "No way! No one knows that much!" You don't have to know the answers to children's questions in order to be helpful to them. But there are some things you can do:

- **Take their questions seriously, and admit when you don't know the answers.** Your child might ask, "Did dinosaurs burp?" and you could answer, "I don't know. What do you think?"
- **Teach your children how to find information.** "I don't know what kind of rock that is. Let's see if we can find the answer." Together you can ask at the library, or find a neighbor or teacher who might know.
- **Enjoy the world with your children.** "Look at that beautiful sunset." Some things can't quite be explained. Wonder is part of science, too.
- **Try to appreciate your child's curiosity, even if it makes you uncomfortable.** Sometimes parents are afraid of things that children find interesting, like bugs or thunder. It helps to talk to your children about the reasons for your feelings.

Points to keep in mind—

- Everyone is involved in science every day.
- Science is a set of activities, a set of skills, information, and a way of thinking.
- Scientific information can help children make everyday decisions and solve problems.
- Children are naturally curious.
- Scientific experience can help children learn to take care of themselves and to develop positive attitudes toward learning.
- Parents can help children learn science in many ways and places: at home, outdoors, while running errands, or on trips.
- Parents can create an atmosphere that encourages science learning by paying attention to their children, sharing their own interests and observations, encouraging them to talk about their science experiences, and providing books and materials.
- Parents don't have to know all the answers. Parents can help children find their own answers through their own activities. This is science.

Parents play an important role in helping their children learn science.

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This series, **Getting Involved**, was developed as part of the Basic Educational Skills Project, a Head Start Research and Demonstration Initiative in Collaboration with Elementary Schools.

Other books in this series are:

Your Child and Language
Your Child and Math
Your Child and Play
Your Child and Problem Solving
Your Child and Reading
Your Child and TV
Your Child and Writing
Your Child's Attitudes Toward Learning

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